



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
1200 Sixth Avenue  
Seattle, Washington 98101

March 17, 1999

Reply To  
Attn Of: ECL-113

Mr. Jim Stefanoff  
CH2M Hill  
9 South Washington, Suite 400  
Spokane, WA 99204-0219

Re: Comments on the January 1999 Draft Bunker Hill Mine Water Presumptive Remedy Documents

Dear Jim:

As we discussed in Spokane at the Bunker Hill Mine Water Workshop (workshop) on March 2 and 3, please find my comments below on the January 1999 Draft Bunker Hill Mine Water Presumptive Remedy Documents. These comments supplement discussion that took place at the workshop. I have also enclosed comments provided by Patty McGrath, EPA Region 10 Office of Water, Nick Ceto, EPA Region 10 Mine Waste Coordinator, and Orville Kiehn, EPA Region 8 Mining Engineer. After reviewing the comments, please contact me if you have any questions. Otherwise, I understand that the comments will be addressed in the Final documents.

**Bunker Hill Mine Water Conceptual Model**

1. General - Please add a glossary to this document of frequently used mining-related terms, e.g., drifts, stopes, shafts, chutes, raises, yellow boy, drill holes, and bedding planes.
2. On page 5, the next-to-last bullet, the term "upper country" is used. Please provide further specification in the text as to the location of the upper country.
3. Page 8, Section 3.2, first paragraph. Please state why samples are not collected from the Stanley Crosscut.
4. Page 20, Section 5.3.1. This paragraph identifies various features associated with 3 level flow (the Homestake Workings, the Utz Workings, the Flood-Stanly ore body, the Cate Fault, the Homestake Tunnel entrance) and refers the reader to Figure 3-1 for a map of major flow paths. Is it possible to identify the referenced features on Figure 3-1? Please disregard if this results in a very "messy" figure.



5. Page 21, Section 5.3.3. I believe that the reference to figure 3-2 in this paragraph should be to Figure 3-3.
6. Page 22, Section 5.4.1. Please indicate in this paragraph whether the West Fork Milo Creek flows continuously or seasonally.
7. Page 28, second paragraph. Please indicate why water quality is discussed in terms of zinc concentration, i.e., why is zinc a good indicator of water quality?
8. Page 31 (last sentence that carries on to page 32). This sentence states that "Table 3 shows that current submerged workings data exhibit higher pH and conductivity." This is not readily apparent to me by looking only at the Table. Could you indicate on the Table (perhaps by footnote or shading) those sampling locations that receive water from submerged workings?
9. Page 44, second paragraph. A sentence in this paragraph indicates that "The remaining zinc load at 9LA is most likely from Flood-Stanly discharge from non-point sources." Could you give an example here of what is meant by "non-point" sources?
10. Page 48, top paragraph. Please include a sentence or two on how additional flume installations and sampling at appropriate locations will help us assess the effectiveness of potential AMD mitigation measures at the mine.

#### **Bunker Hill Mine Water Presumptive Remedy - Executive Summary**

1. Page 1, second paragraph. Please add "the mine owner" to the list of workshop attendees.

#### **Bunker Hill Mine Water Presumptive Remedy - AMD Mitigations Evaluation**

1. General. Throughout this document, and in reference to the potential diversion projects, we refer to the Buckeye, Cate, and Katherine faults. In Section 4.4.2 we identify as a data need "verification of fault locations in order to better locate diversion sites." Please address, in an appropriate location, our certainty as to the location of these faults.
2. Page 10, top of page. Please add to the list of bulleted items something that acknowledges that flooding the mine would limit the extent of the ore body available for active mining operations.
3. Page 11, Section 4.1.2. Please replace the second bulleted item (anticipated acceptability to the mine owner) with "impact on current mining operations."

4. Page 11, Section 4.1.2. Please replace the third bulleted item as follows: change "local governments" to "State and/or local governments."
5. Page 18, first bullet at top of page. Please change "local government" to "State and/or local government."
6. Page 20, last paragraph. Please define "SDR."
7. Page 21, Section 4.2.2.2. The text in this section refers to the flow of water from West Milo into the Guy Cave area and then assumedly into the mine. I'm thinking of John Riley's comments at the March 2 and 3 workshop where he noted, I thought, that West Milo water never reached the Guy Cave area as it was intercepted by the Katherine fault. Please make any appropriate corresponding changes to this section. Also, could you please clarify our understanding of the connection between the surface water that infiltrates the Guy Cave area and its impact on the mine?
8. Page 22, Section 4.3.2. In the second bullet please change "agreements from the local government" to "agreements from the State and/or local government."

#### **Bunker Hill Mine Water Presumptive Remedy - AMD Collection, Conveyance, and Storage**

1. Page 13, Section 2.4. Please add a brief introductory sentence or two describing why were looking at alternative collection schemes.
2. Page 14, Section 3.1. This section refers to the "Lined Pond," although the referenced Figure (#5) refers to the "Mine Water Storage Pond." Please make the text and figure consistent.
3. Page 16, Table 1. Either in the text associated with this table, or in a footnote to the table, please cite the source of the listed data and the years for which the data was collected.
4. Page 17, Section 3.2.2. The first paragraph in this section states that the installation date for the 24 inch conveyance pipeline is unknown. Can we at least say that it was likely installed before some date?

#### **Bunker Hill Mine Water Presumptive Remedy - AMD Treatment**

1. Page 4, Section 2.0, second paragraph. This paragraph notes that water from the Sweeney/004 outfall which currently enters the lined pond will be discontinued in the future. Could you please add a few sentences addressing where this water comes from, how its flow has decreased over time, and why we expect it to dwindle to nothing in the future. Perhaps Bill Hudson could help with this.

2. Page 10, Table 4. Please include a footnote to the Table defining "7Q10 River Flow."
3. Page 13, Section 3.2.1. If appropriate, please update this section based on attached information from Orville Kiehn, EPA Region 8, as discussed at the March 2 and 3 workshop in Spokane.
4. Page 27, Table 9. Please include a footnote to this table which defines the terms "media-filtration" and "micro-filtration."
5. Page 28, Table 10. In this table, please identify the 7Q10 River Flow and 50% River Flow as "Draft" TMDLs. Also, please include a note in the table or associated text which discusses any issues associated with using "total" metal data to compare to a draft TMDL which is based on "dissolved" metals, i.e., is it even appropriate to make this comparison in the table?
6. Page 29, Table 11. At the March 2 and 3 workshop, I believe that Bob York noted that the cost figure for alternative 4a was incorrect on this table. Please correct.

Sincerely,

*Mary Kay Voytilla*

Mary Kay Voytilla  
Project Manager

Enclosures (3)

cc: w/enclosures

Mike Thomas, DEQ  
Nick Zilka, DEQ  
Bill Hudson, CH2M Hill  
Mike Fitzgerald, Terragraphics